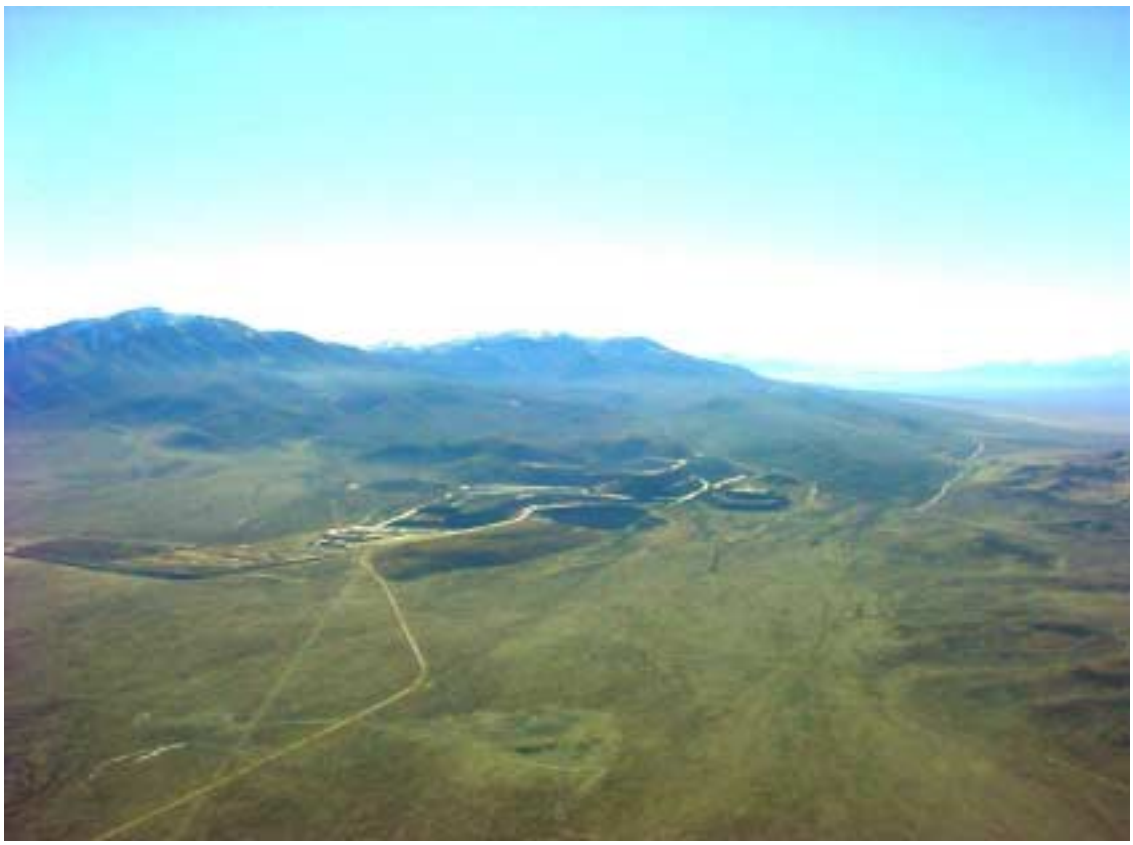
United States Department of the Interior
Bureau of Land Management
Winnemucca Field Office

April 2003

Draft
Supplemental Environmental Impact Statement
Glamis Marigold Mining Company's
Millennium Expansion Project



Cooperating Agency:

Nevada Department of Conservation and Natural Resources, Division of Wildlife

BLM MISSION STATEMENT

The Bureau of Land Management is responsible for the stewardship of our public lands. It is committed to manage, protect, and improve these lands in a manner to serve the needs of the American people for all times.

Management is based upon the principles of multiple use and sustained yield of our nation's resources within a framework of environmental responsibility and scientific technology. These resources include recreation, rangelands, timber, minerals, watershed, fish and wildlife, wilderness, air and scenic, scientific and cultural values.

BLM/NV/PL-03/006+1610

United States Department of the Interior

BUREAU OF LAND MANAGEMENT
Winnemucca Field Office
5100 East Winnemucca Boulevard
Winnemucca, Nevada 89445
(775) 623-1500
http://www.nv.blm.gov/winnemucca

In Reply Refer To:
3809/1792
NV020.06

APR 0 4 2003

Dear Reader:

Enclosed for your review and comment is the Draft Supplemental Environmental Impact Statement for Glamis Marigold Mining Company's Millennium Expansion Project, prepared by the Bureau of Land Management (BLM), Winnemucca Field Office.

The Draft Supplemental Environmental Impact Statement is based on the Plan of Operations submitted to the BLM under 43 Code of Federal Regulations 3809. This Draft Supplemental Environmental Impact Statement analyzes the direct, indirect, and cumulative impacts associated with consolidation and deepening of the Top Zone Pit and Red Rock Pit into the Terry Zone Pit, mining of five new pits (Mackay, Target No. 1 Pit, Target No. 2 Pit, Antler Pit, and Basalt Pit), construction of two new heap leach facilities and expansion of the existing heap leach facility, expansion of existing waste rock storage areas and creation of new waste rock storage areas, development of new support facilities (truck shop, warehouse, offices, fuel and oil storage and dispensing areas, etc.), expansion of ancillary facilities (power lines, water supply system, haul and access roads, storm water control structures, fencing, materials storage areas, etc.), and modification of the closure and reclamation measures for the existing and proposed heap leach pads.

The BLM is interested in your review and comment on the proposed action and alternatives for the Millennium Expansion Project. Public comments will be accepted during the 60-day comment period. Written comments on the Draft Supplemental Environmental Impact Statement must be postmarked by June 5, 2003, and should be sent to: Mr. Jeff Johnson, SEIS Project Manager, Bureau of Land Management, Winnemucca Field Office, 5100 E. Winnemucca Boulevard, Winnemucca, Nevada 89445.

In addition, public meetings to accept verbal comments are scheduled for the following dates, times, and locations. All meetings will start at 7:00 P.M.

May 13, 2003	Winnemucca Field Office, 5100 E. Winnemucca Blvd., Winnemucca, Nevada
May 14, 2003	Battle Mountain Field Office, 50 Bastian Road, Battle Mountain, Nevada

A Final Supplemental Environmental Impact Statement (FSEIS) will be prepared that will consider the comments received during the public review and comment period. This FSEIS will be in the non-abbreviated format and will incorporate changes made to the Draft SEIS as a result of public comments. For additional information, please contact Jeff Johnson at the above address or at (775) 623-1500.

Sincerely,

for Terry A. Reed
Field Manager

DRAFT
SUPPLEMENTAL ENVIRONMENTAL IMPACT STATEMENT
MILLENNIUM EXPANSION PROJECT

Lead Agency:	U.S. Department of the Interior Bureau of Land Management Winnemucca Field Office
Project Location:	Humboldt County, Nevada
Comments on this SEIS Should be Directed to:	***Jeff Johnson*** SEIS Project Manager Bureau of Land Management Winnemucca Field Office 5100 East Winnemucca Blvd. Winnemucca, NV 89445 (775) 623-1500
Date Draft SEIS Filed with EPA:	March 31, 2003
Date by Which Comments Must Be Received by the BLM:	June 05, 2003

ABSTRACT

Glamis Gold, Inc., doing business as Glamis Marigold Mining Company (GMMC) proposes to construct new facilities and expand existing gold mining operations at the Marigold Mine in Humboldt County, Nevada. The mine is located on public and private lands near Interstate Highway 80 approximately 13 miles northwest of Battle Mountain and approximately 40 miles southeast of Winnemucca.

The proposed Millennium Expansion Project would disturb approximately 667 acres of private land and 807 acres of BLM-administered public land, for a total of 1,474 acres. The proposed project would include: consolidation and deepening of two pits and development of five new pits; expansion of one waste rock storage area and development of three new waste rock storage areas; development of two new heap leach facilities and expansion of the existing heap leach facility; haul roads, solution ponds, growth media stockpiles, exploration drill pads and access roads, and storm water diversion channels; new support facilities; water supply system; and miscellaneous ancillary facilities. The Proposed Action would extend the mine operations an additional six years through 2013.

This Draft Supplemental Environmental Impact Statement analyzes the environmental effects of the Millennium Expansion Project, the Trout Creek Diversion Realignment Alternative, the Expanded Red Rock Pit Stabilization Alternative, and the No Action Alternative.

Responsible Official for SEIS:

for Terry A. Reed

Field Office Manager
Winnemucca Field Office

EXECUTIVE SUMMARY

PROPOSED ACTION

Glamis Marigold Mining Company (GMMC) proposes to construct new facilities and expand existing gold mining operations at the Glamis Marigold Mine in Humboldt County, Nevada. The mine is located on public and private lands near Interstate Highway 80 (I-80) approximately 13 miles northwest of Battle Mountain and approximately 40 miles southeast of Winnemucca, Nevada. The mine has been in continuous operation since 1988, and as Glamis Marigold Mine since 1999. Historical mining in the proposed project vicinity dates back to 1927. To date, approximately 1,831 acres have been disturbed or authorized for disturbance.

A Plan of Operations Amendment and Reclamation Plan for the proposed Millennium Expansion Project was submitted to the Bureau of Land Management (BLM) in April 2002. Current mine facilities consist of a series of pits, waste rock storage areas, a heap leach pad and associated processing plant, a tailings impoundment, access and haul roads, and ancillary facilities.

The BLM completed an environmental impact statement (*Final Environmental Impact Statement Marigold Mine Expansion Project*, BLM/WN/PL-01/009+1610 [FEIS]) at the Glamis Marigold Mine in 2001. The modification to the Plan of Operations, known as the Millennium Expansion Project, proposes facilities similar in nature to those analyzed in the previous FEIS. Therefore, BLM has determined that a Supplemental Environmental Impact Statement (SEIS) is required for the proposed Millennium Expansion Project.

The proposed Millennium Expansion Project includes the following new and expanded facilities:

- Consolidation and deepening of two existing pits;
- Expansion of an existing waste rock storage area
- Expansion of internal project access and haul roads, power line and substation facilities, communications systems, and water distribution system;
- Development of five new mining areas;
- Development of three new waste rock storage areas;
- Backfilling two of the new pits;
- Development of two new heap leach pads and associated processing facilities;
- Expansion of the existing heap leach facility, including a new heap leach pad cell, a solution conveyance channel, and expansion of the existing processing facilities;
- Modification of Heap Leach Closure and Stabilization;
- Development of new support facilities;
- Storm water diversion ditches;
- Water storage components; and
- Miscellaneous ancillary facilities.

The proposed Millennium Expansion Project would disturb approximately 667 acres of private land and 807 acres of BLM-administered public land, for a total additional surface disturbance of 1,474 acres. The Proposed Action would extend the mine operations a maximum of six years through 2013.

ALTERNATIVES

This SEIS analyzes the direct, indirect, cumulative, and residual environmental impacts of the Proposed Action, two Alternative Actions, and the No Action Alternative. The alternatives are described in the following sections.

Alternative 1 - Trout Creek Diversion Realignment

Trout Creek was originally diverted to permit mining of the 8-South Pit and construction of the 8-South Waste Rock Storage Area. The stabilization of the diversion has been previously analyzed in the Resort EA (BLM EA # N26-88-005P) and March 2001 FEIS with respect to the Red Rock Pit. The analysis identified concerns with the long-term stability and potential failure of the west highwall in the Red Rock Pit, which could result in flow from Trout Creek entering the Red Rock Pit.

The proposed consolidation of the Red Rock and Top Zone pits into the Terry Zone Pit by combining and deepening portions of the two pits has created concern over the long-term stabilization of the Trout Creek Diversion/Red Rock Pit high wall.

All components of the Proposed Action are part of this Alternative. Under this Alternative a new diversion channel would be constructed that would parallel the existing Trout Creek channel and eventually flow into the north end of the existing Trout Creek Diversion. The new diversion channel would be 100 to 200 feet west of the existing channel. To achieve the required channel elevation and stream gradient, the new diversion would need to be excavated into the side of a small hill. The new channel would be approximately 2,300 feet in length. The new diversion would be designed to accommodate the 100-year, 24-hour event within the constructed channel. Approximately 12 acres of disturbance would be associated with the new channel diversion.

Alternative 2 - Expanded Red Rock Pit Stabilization

All components of the Proposed Action are part of this Alternative. Under this Alternative the buttress previously authorized for the Red Rock Pit would be expanded and constructed with waste rock material to provide additional long-term stability. The expanded buttress would consist of backfilling the west side of the Red Rock Pit to an elevation ten feet above the west pit crest and ten feet beyond the pit footprint along the entire length of the west highwall. Waste rock material would be backfilled into the pit to form the buttress. The buttress would be designed to divert or withstand the flow from the 100-year, 24-hour event. The backfill would be graded to approximately 3H:1V within the pit and 2H:1V on the Trout Creek side of the buttress (i.e., the portion that would be resloped and extend beyond the pit footprint). The buttress would have a crest width of 30 feet after re-sloping to 3H:1V, growth media would be placed and reseeded.

Alternative 3 - No Action Alternative

Under the No Action Alternative, currently permitted operations at the Marigold Mine would cease after 2007, with final reclamation extending ten years beyond closure. Additional minerals in the project area would remain undeveloped, and no construction or expansion of mine pits, waste rock storage areas, heap leach pads, or other ancillary facilities would occur.

IMPORTANT ISSUES AND IMPACT CONCLUSIONS

A small number of issues were raised during scoping for this SEIS. Public scoping meetings were held in Winnemucca and Battle Mountain, Nevada, on August 14 and 15, 2002, respectively. Additional issues were identified by resource specialists during the preparation of the SEIS. These issues along with their impact conclusions are presented below. Impact conclusions include the implementation of mitigation measures that have been identified. These measures are presented in detail in Chapter 3.0 of this SEIS for each affected resource.

Water Resources and Geochemistry

Issue: Formation of a pit lake as a result of mine development and impacts to wildlife from degraded water quality.

Conclusion: The construction and development of the proposed new pits would not create pit lakes. All new pit floors

would be above the established groundwater table. The consolidation and deepening of the existing Top Zone Pit and Red Rock Pit into the Terry Zone Pit has potential to intercept the groundwater table. The pit would be partially backfilled to a level above the established pre-Lone Tree Mine dewatering water table; no pit lake would be created.

Issue: Impacts to surface water and groundwater levels resulting from pit dewatering and groundwater use for mine operations.

Conclusion: Based on the evaluation of historic and current groundwater level data within the project vicinity, hydrologic impacts to springs or intermittent creeks located in or near the project are not anticipated. Springs and intermittent creeks located in or near the project area would not be affected since the water source for the springs and intermittent creeks is not hydrologically connected with the bedrock aquifer. No pit dewatering is anticipated during mining. Water used for the proposed mine operations would be obtained from the Lone Tree Mine and supplemented with the water from water supply wells in the project vicinity. The source of water for the water supply wells is mainly the bedrock aquifer, whereas the source of water for the springs and intermittent creeks is shallow alluvium and surface flows resulting from runoff.

Issue: Long-term stability of Trout Creek Diversion Channel.

Conclusion: Potential exists for impacts from failure of the Red Rock Pit highwall/Trout Creek Diversion. Two alternative actions have been developed to address this issue.

Issue: Degradation of groundwater quality.

Conclusion: Waste rock storage areas, heap leach facilities, and pit backfill areas would be covered with an evapotranspiration store and release cover (ET cover) system to limit meteoric water infiltration. Overall geochemical testing indicates that waste rock from the mine has low potential to generate acidic seepage. However, some constituents of the waste rock could be mobilized, but would not be expected to reach groundwater due to predicted low infiltration rate ($1.5x10^{-7}$ gallons per minute per square foot) through the heap leach pads. Heap leach drain down would remain in containment and would be managed by passive water management facilities.

Air Quality

Issue: Cumulative impacts to air quality.

Conclusion: The annual and 24-hour contributions from the mine sources would not cause the air quality in the region to degrade below national or state ambient air quality standards.

Vegetation Resources

Issue: Loss of wetland or riparian areas resulting from the mine expansion or dewatering.

Conclusion: Wetlands or riparian areas would be avoided by the operator. No dewatering is proposed for this project. Impacts to wetlands or riparian areas are not anticipated.

Wildlife and Fisheries Resources

Issue: Wildlife habitat disturbed or lost.

Conclusion: No riparian habitat would be affected. Loss of upland habitat would not exceed 1,474 acres. The value of habitat lost would be low to moderate, due to the proximity of the project to past and present disturbances and activities and the availability of native habitats in the surrounding region. Approximately 1,204 acres of disturbed habitat would be reclaimed.

Issue: Loss of mule deer winter range.

Conclusion: A total of 1,263 acres of mule deer winter range would be removed for the life of the project.

Issue: Impacts to resident and migratory birds.

Conclusion: Potential effects to breeding birds (e.g., passerines, raptors) could occur from incremental habitat loss, disturbance to nesting habitat, and increased noise and human presence. These impacts would be minimized by the applicant committed protection measures. Effects to upland game birds would be minor, based on relative habitat value, bird species occurrence, and committed protection measures.

Issue: Measures to prevent wildlife exposure to cyanide solutions on heaps, in solution channels, and ponds should be developed.

Conclusion: Potential impacts from cyanide ingestion would be low, since bird netting would be installed over the solution ponds and GMMC would monitor heap leach pads to avoid the puddling of cyanide solution.

Special Status Species

Issue: Potential impacts to special status species.

Conclusion: Removal of nesting habitat for burrowing owl and winter habitat for sage grouse would occur under the Proposed Action and alternatives. The loss would be temporary until facilities are successfully reclaimed.

Range Resources

Issue: Loss of available grazing land and interference in ranch management activities resulting from the construction of the range perimeter fence.

Conclusion: Construction of the range perimeter fence would remove 1,586 acres of rangeland available for grazing resulting in the temporary loss of 79 animal unit months. A permanent loss of 14 animal unit months would result after mine reclamation. The perimeter fence and mine facilities would interfere with livestock trailing routes.

Land Use and Access

Issue: Access to private land, mineral claims, and grazing leases.

Conclusion: Private land within the mine permit boundary that is not under GMMC's control would remain accessible, as would the livestock forage on these lands. Existing mining claims would also remain accessible.

Aesthetics (Visual and Noise Resources)

Issue: Visual contrasts with elements of the characteristic landscape in exceedence of BLM Visual Resource Management (VRM) objectives.

Conclusion: The Proposed Action and the Alternative Actions would result in moderate contrasts with existing forms, lines, and textures of the characteristic environment as a result of the construction of the new heap leach facility and expansion of the waste rock storage areas. These contrasts would not exceed VRM objectives during the life of mining. If proposed reclamation efforts were successful, visual contrasts would be reduced to near pre-mining levels within ten years of the reclamation period.

Cultural Resources

Issue: Direct physical disturbance of cultural resources that are listed on or are eligible to the National Register of Historic Places or are protected under state or other Federal statutes.

Conclusion: GMMC has proposed new environmental protection measures for known eligible sites near the proposed facilities. These measures are designed to avoid inadvertent impacts to these sites. In addition, environmental protection measures involving cooperation between GMMC, the BLM, the State Historic Preservation Officer, and the Advisory Council on Historic Preservation would be implemented if cultural resources are discovered or affected during construction or operation activities. Based on the protection measures, proper steps would be taken to evaluate the quality of the resource, to determine whether the loss is acceptable, and to mitigate losses that are not acceptable. Known sites in the project area would be avoided by mining and exploration activities.

Issue: Utilize native species in reclamation seed mixes.

Conclusion: The interim seed mix would include crested wheatgrass, which is a non-native species. This species would be used since it readily establishes on disturbed sites and reduces soil erosion. The permanent reclamation seed mix to be used during reclamation would consist of native species.

Ethnography

Issue: Direct physical disturbance of traditional use sites that are listed on or are eligible to the National Register of Historic Places or are protected under state or other federal statutes.

Conclusion: No traditional use sites that are listed on or are eligible to the National Register of Historic Places have been identified in the Millennium Expansion Project Area. The general area and the springs near the Proposed Action have been identified as traditional use areas for hunting, food gathering, and trails to other areas.

Paleontology

Issue: Impacts to significant paleontological resources.

Conclusion: Significant fossil-bearing formations have not been identified in the project area to date. However, if previously

unidentified paleontological resources are located during the Millennium Expansion Project, environmental protection measures designed to mitigate impacts would be implemented, as per BLM policy.

AGENCY-PREFERRED ALTERNATIVE

In accordance with the National Environmental Policy Act, Federal agencies are required by the Council on Environmental Quality (40 Code of Federal Regulations 1502.14) to identify their preferred alternative for a project in the Draft SEIS, if a preference has been identified, and in the Final SEIS prepared for the project. The preferred alternative is not a final agency decision; it is rather an indication of the agency's preliminary preference. The alternative identified below is the BLM's preferred alternative at the Draft SEIS stage in the environmental review process. This preference may be changed based on the agency and public comments that are received on this Draft SEIS. The BLM's preference at this time considers all information that has been received and reviewed relevant to the proposed project. The agency-preferred alternative is Alternative 2 as described in the SEIS, with all appropriate mitigation.

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1.0 INTRODUCTION

Glamis Gold Ltd, doing business as Glamis Marigold Mining Company (GMMC), operates the Glamis Marigold Mine, located approximately three miles south of Valmy in the southeastern portion of Humboldt County, Nevada. GMMC has submitted a *Plan of Operations/Reclamation Permit Modification* (PoO Modification) for the Millennium Expansion Project to the Winnemucca Field Office of the U.S. Bureau of Land Management (BLM) and to the Nevada Division of Environmental Protection (NDEP), Bureau of Mining Regulation and Reclamation (BMRR) to describe proposed changes to *Plan of Operations (N26-88-005P/N-65034)* and Nevada State Reclamation Permit No. 0108 for the Glamis Marigold Mine.

GMMC proposes to expand the mining, heap leaching and ancillary facilities at the Glamis Marigold Mine beyond the expansion authorized in the September 2001 Record of Decision for the *Final Environmental Impact Statement Marigold Mine Expansion Project*, BLM/WN/PL-01/009+1610 (FEIS) and July 2001 modification to the Reclamation Permit. GMMC also proposes the development of new facilities and modifications to the closure and reclamation plan for the existing Glamis Marigold Mine heap leach facilities.

The existing mining operation consists of multiple open pits and precious metal processing facilities, which are located approximately three miles south of Valmy, Nevada (Figures 1-1 and 1-2). The mine is located on public and private lands approximately 13 miles northwest of Battle Mountain and approximately 40 miles southeast of Winnemucca. GMMC has been operating the Glamis Marigold Mine since 1999.

The proposed Millennium Expansion Project consists of expansion of some of the existing Glamis Marigold Mine facilities, the development of new facilities, and modification to the closure and reclamation plan for the existing and currently authorized heap leach pads. The Millennium Expansion Project was described as a “reasonably foreseeable action” in the FEIS (BLM 2001; Section 2.6.2). The mining activities proposed for public lands are subject to review and approval by the BLM pursuant to the Federal Land Policy and Management Act (FLPMA) and subsequent surface management regulations (43 Code of Federal Regulations [CFR], Subpart 3809). The activities, and their approval by the BLM pursuant to FLPMA, constitute a federal action and are thus subject to the National Environmental Policy Act (NEPA). The BLM has determined that the proposed Millennium Expansion Project constitutes a major federal action. However, the proposed new and expanded mining and heap leaching activities, and associated support facilities are similar to the types and magnitude of activities described and analyzed in the EIS. No new environmental concerns, interests, resource values, or circumstances in the vicinity of the Glamis Marigold Mine have been identified since the publication of the EIS. Therefore, BLM has further determined that a Supplemental EIS (SEIS) must be prepared to fulfill NEPA requirements.

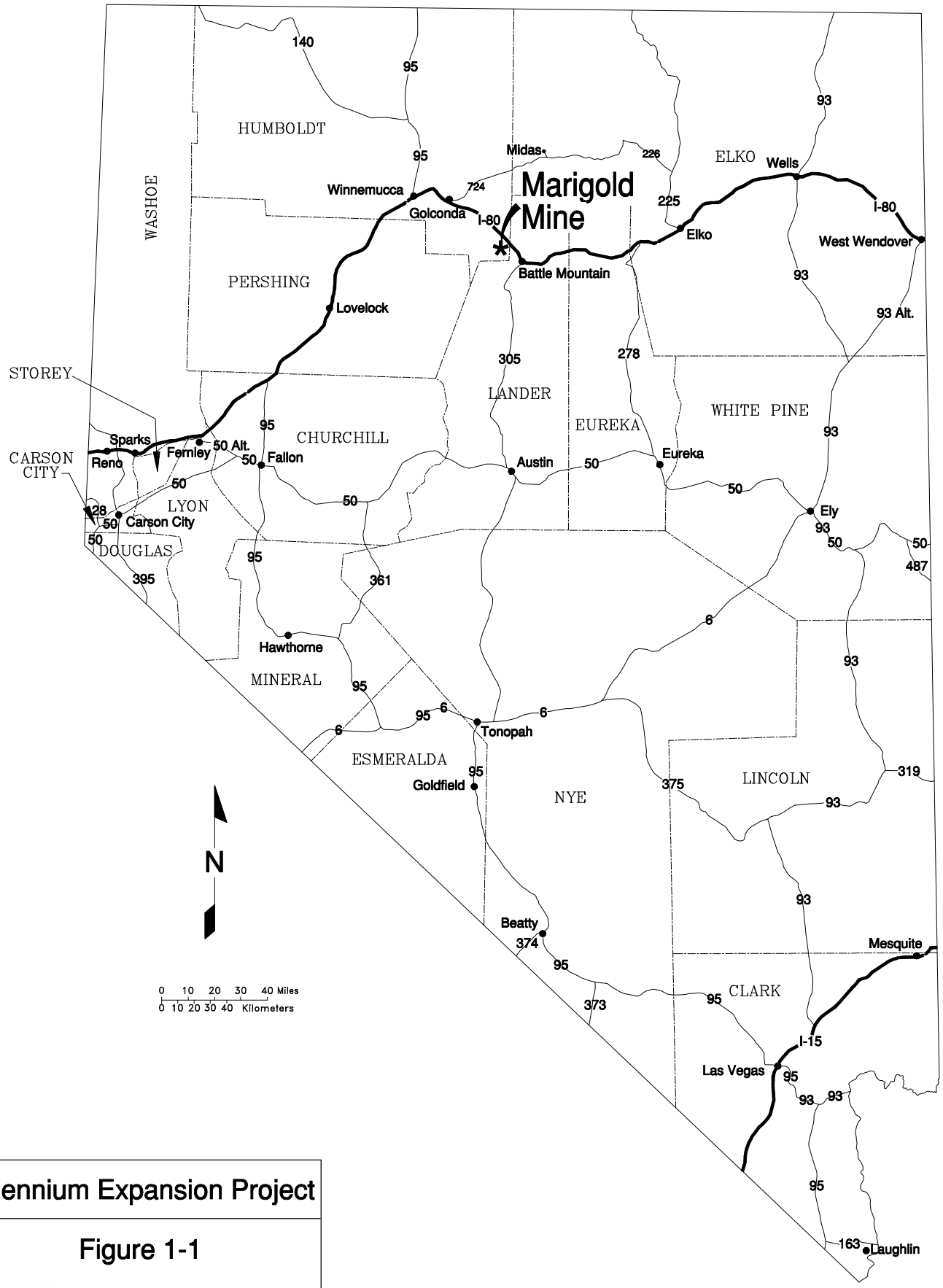
The SEIS is being prepared by the BLM, which is the lead agency with respect to compliance with NEPA and its implementing regulations. The Nevada Department of Conservation and Natural Resources, Division of Wildlife (NDOW) is a cooperating agency for the preparation and review of the SEIS.

The SEIS is prepared in compliance with NEPA, and in accordance with BLM Handbook H-1790-1 and Nevada State Office (NSO) Instruction Memorandum NV-90-435 regarding the analysis of cumulative impacts. The SEIS considers the quality of the natural environment based on the physical impacts to public and private lands that may result from implementation of the Millennium Expansion Project.

1.1 Mine History

A detailed history of the mining activity is provided in the Marigold Mine Expansion Project FEIS (BLM 2001) and summarized below.

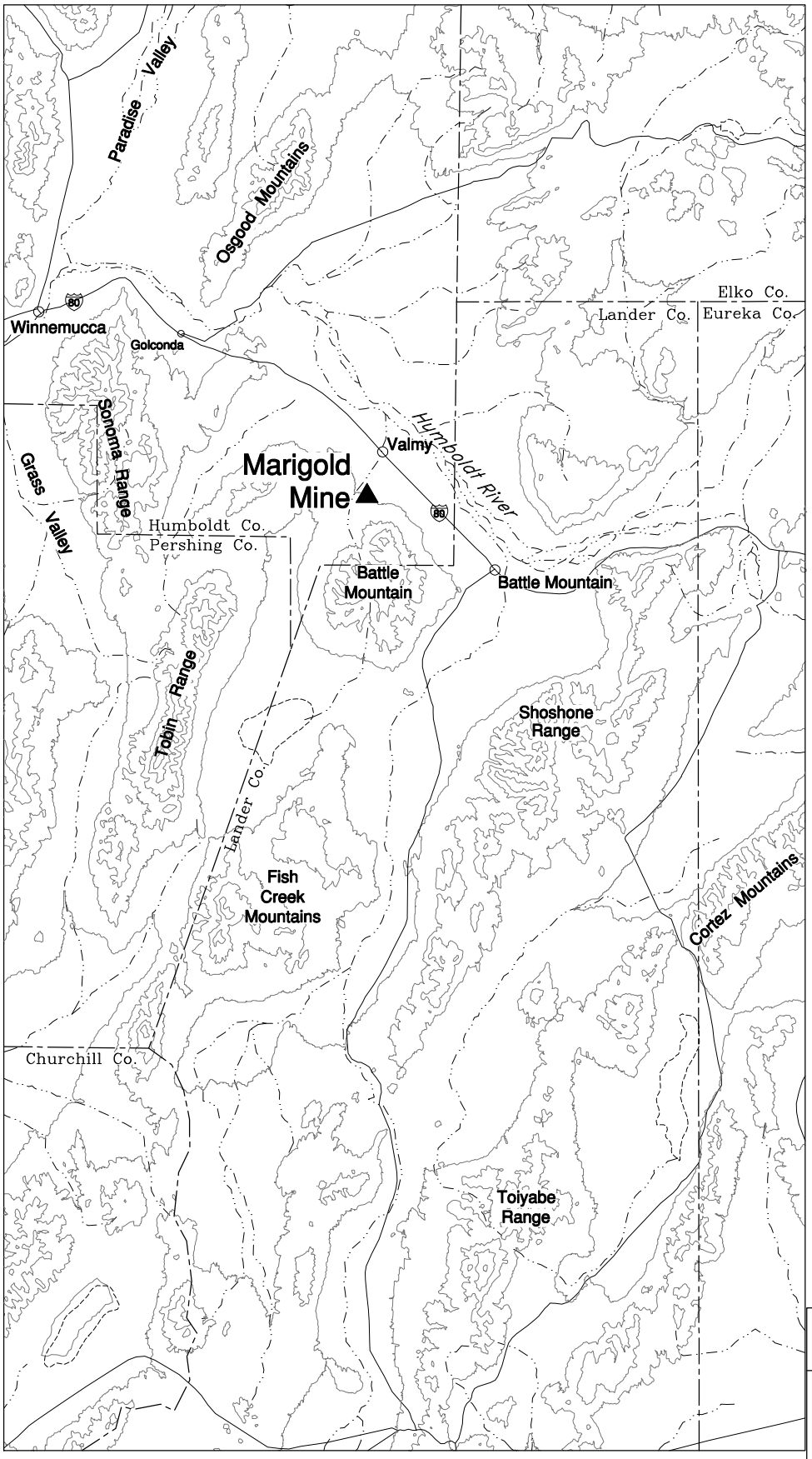
Mining activities began in the Project Area in 1927 when three claims were staked that would later be named the Marigold Mine. Additional claims were staked until 1940 when underground mining was



Millennium Expansion Project

Figure 1-1

Project Location



Legend

- County
- Interstate 80
- Road
- River or Intermittent Drainage
- Playa
- Subject Property

N

0 5 10 Miles

Millennium Expansion Project

Figure 1-2

Local Vicinity Map

initiated and approximately 10,000 tons of ore, averaging 0.2 ounces of gold per ton, were processed. Operations ceased during World War II.

Exploration and geochemical testing continued through 1980. Mining resumed in 1983 when the Marigold Development Company and successor companies crushed and heap leached about 3,100 tons of gold ore mined from a small open pit located above the old underground workings. The gold production rate was 271 ounces during 1983 and 1984. VEK Associates staked several claims in a general area located south of Valmy, approximately one mile north of the old Marigold Mine. During 1984 and 1985, geophysical surveys and exploratory drilling were completed within the claims area (Section 8) by the Cordex Exploration Company (a partnership of Dome Exploration (U.S.) Limited, Rayrock Mines, Inc., and Lacana Gold, Inc.). Two of the exploration drill sites intersected gold-bearing ore bodies with higher gold concentrations (i.e., 0.07 to 0.22 ounces per ton) than other sites.

Santa Fe Pacific joined the partnership in 1986 and provided some additional land that allowed continued exploration drilling in the area. Later that year, Welcome North and Nevada North (small Canadian companies) joined the partnership. Additional drilling and completion of a feasibility study lead to the decision in March 1988 to develop a mine and mill/heap leach operation, with Rayrock Mines, Incorporated named as the operating partner. Stripping the main "8-South" deposit began in September 1988. The first doré bar was poured in August 1989.

Approximately 178 million tons of ore and waste rock have been removed during mining activities through December 2002. This estimate included 38.0 million tons of combined leach-plus-mill ore that contained 1.3 million ounces of gold. Approximately five million tons of mill ore, averaging 0.108 ounces of gold per ton, were processed in a conventional cyanide-in-leach mill. Gold was extracted from the remaining 33 million tons of ore, containing 0.023 ounces of gold per ton, via run-of-mine heap leaching processes. The gold recovery rate from milling and leaching processes was approximately 90 and 70 percent, respectively.

The various joint ventures purchased the Welcome North/Nevada North interests and exchanged the newly discovered Stonehouse ore body plus additional land to Santa Fe Pacific for their 30 percent interest and other lands. Homestake Mining Company joined the partnership as a result of their acquisition of Corona Gold, Inc., the successor to Cordex partner Lacana Gold. Shortly after the completion of these transactions, Rayrock purchased Dome's interest (33.3 percent). Glamis Gold, Ltd. acquired Rayrock Mines, Inc. in 1999 and Barrick Gold Corporation acquired Homestake Mining Company in 2002. Currently, GMMC and Barrick Gold Corporation own 66.7 and 33.3 percent of the project, respectively.

1.2 Existing Operations

Activities within the Glamis Marigold Mine operations area have expanded periodically since production began in 1988, and full-scale operations currently continue. These operations have been analyzed in three Environmental Assessments (EAs), one EIS, and several minor modifications approved by the BLM. Current mine facilities, either active or approved, include seven mining areas. Three of the pits are currently being mined (Top Zone, East Hill, and Red Rock). Two of the pits are presently inactive (Old Marigold and 8-South) and two pits (5-North and 8-North) have been authorized but not yet developed. Other existing mine facilities include five waste rock storage areas (four developed and one authorized but not yet constructed), two heap leach processing areas (one active and one authorized but not constructed), and associated processing plant, mill, two tailings impoundments (one in closure and one authorized but not constructed), access and haul roads, and ancillary facilities (Figure 1-3).

LEGEND

- GROWTH MEDIA STOCKPILE
- PROCESS FACILITY
- FACILITY, HAUL ROADS, "INFILL" AREA, ETC.
- SURFACE WATER DIVERSION
- PRIVATE LAND/PUBLIC LAND CLAIM BOUNDARY
- EXISTING PERMIT BOUNDARY
- WW FRESH WATER SUPPLY WELL
- AUTHORIZED BUT NOT YET CONSTRUCTED

Millennium Expansion Project

Figure 1-3

Marigold Mine Existing Facilities

Mining currently involves excavating a total of 2.5 million tons of waste rock and ore per month, and is conducted on 20- to 40-foot benches in the existing and authorized pits. Ongoing mine operations are described in the PoO and BLM plan #N26-88-005P, as amended July 3, 1997, May 27, 1998, and August 6, 1998. BLM also prepared an EIS for the Marigold Mine Expansion Project based on amendments to BLM PoO #N26-88-005P and Nevada State Reclamation Permit No. 0108. The Record of Decision for the FEIS was issued in September 19, 2001 and amendment to the Reclamation Permit was issued on July 6, 2001.

In February 2002, GMMC submitted a Minor Modification to the PoO and Reclamation Permit. This modification involved changes in the configuration of the heap leach facilities and several operational changes (i.e., increased mining rate and the addition of new mining equipment), but did not increase the acres of surface disturbance or substantively change site operations. BLM authorized the minor modification through a Determination of NEPA Adequacy in March 2002, and NDEP-BMRR approved the minor modification in April 2002 The approved amendments comply with the BLM regulations for surface mining of public land under the General Mining Law (43 CFR 3809), and the State of Nevada regulations for reclamation of land subject to mining operations under Nevada Revised Statutes (NRS 445 and 519A).

Under existing permits, mining and heap leach activities at the Glamis Marigold Mine would continue through 2007. See Table 1-1 for a summary of existing and approved operations at the mine that have been authorized under previous environmental evaluations in 1988, 1997, 1998, and 2001.

1.3 Proposed Action

The proposed Millennium Expansion Project includes the following new and expanded facilities:

- Consolidation and deepening of the Top Zone and Red Rock pits into the Terry Zone Pit;
- Partial backfill of the Terry Zone Pit and other pit areas, as feasible;
- Expansion of the Old Marigold Waste Rock Storage Area;
- Expansion of internal project access roads and haul roads;
- Expansion of power line and substation facilities to extend electrical power to the Millennium Expansion Project components that require power;
- An expanded utility corridor for electrical power, communications systems, and water distribution along the access road;
- Development of five new mining areas: the Mackay Pit, the Target No. 1 Pit, the Target No. 2 Pit, the Antler Pit, and the Basalt Pit;
- Development of three new waste rock storage areas: the 119 million-ton capacity North Waste Rock Storage Area, the five million-ton capacity South Waste Rock Storage Area, and the 31 million-ton capacity West Waste Rock Storage Area;
- Complete backfilling the Target No. 1 and Target No. 2 pits with approximately 84 million tons of material;
- Development of two new heap leach processing facilities: the Section 30 Heap Leach Facility comprised of a 51 million-ton capacity pad, ponds, and adsorption-desorption recovery (ADR) processing facility, and the Section 16 Heap Leach Facility comprised of a 23 million-ton capacity pad, ponds, columns and reagent storage tanks;
- The Millennium Expansion Project ADR Facility, located at the Section 30 Heap Leach Facility, and comprised of the following components: process columns, acid wash

plant, carbon regeneration kiln, retort, electrowinning, refinery, assay lab, reagent storage facilities, office, and enclosures;

- Expansion of the existing heap leach facility by the addition of the Section 17 Heap Leach Pad (Cell 12), a solution conveyance channel, and expansion of the existing processing facilities;
- Modification of the heap closure method for the existing heap leach pads and for the proposed heap leach pads, consisting of an evapotranspiration (ET) storage and release cover, development of passive water treatment for effluent, and/or attenuation/evapotranspiration basins; a leach field would constructed as a water management contingency;

Table 1-1: Glamis Marigold Mine Existing and Authorized Facilities

Mine Component	Activity
Heap Leach Pads	• Marigold Heap Leach Facilities (Cells No. 1, 2, 3, the 2/3 infill area, 4, 5a, 5b, 6, 7, 8, 9, 10, and 11 [Cell No. 11 is also known as the "Southwest Heap Leach Pad Extension]); and • 5-North Heap Leach Pad (not currently developed).
Tailings Impoundment	• Existing Tailings Facility (currently in closure); and • Authorized New Tailings Facility (not yet developed).
Mill and ADR Facilities (Ore Processing)	• Includes leaching tanks, thickening tank, crushing facility, rod and ball mills, carbon columns, screen separator, electrowinning units, stripping units, retorts, refining furnaces, carbon regeneration kiln; no autoclave or roaster is utilized at the mine.
Waste Rock Dumps	• 8-South Waste Rock Storage Area; • Old Marigold Waste Rock Storage Area; • Resort Waste Rock Storage Area; • Top Zone-East Hill Waste Rock Storage Area; and • 5-North Waste Rock Storage Area (not yet developed).
Mining Areas (Open Pits)	• 8-South Pit; • Old Marigold Pit; • Top Zone Pit; • Red Rock Pit; • East Hill Pit; • 5-North Pit (not yet developed); and • 8-North Pit (not yet developed).
Ancillary Facilities	• Growth media stockpiles; • Haul roads; • Water supply system - three water supply wells and the Lone Tree Water Line; • Exploration - continued exploration and ore body delineation; • Support facilities – administrative offices, truck shop, lab, fuel station, warehouse, mobile office structures, substation, laydown yards, ore stockpiles, chemical tanks, parking areas, and fencing; • Surface water diversions – Trout Creek Diversion (around Red Rock, 8-South Waste Rock Storage Area and 8-South Pit – constructed; around 8-North Pit – authorized), Cottonwood Creek Diversion (around 5-North Heap Leach Pad, Pit and Waste Rock Storage Area – authorized), and unnamed diversion (around the new tailings facility – authorized); and • Miscellaneous facilities and infill areas.

- Development of new support facilities in Section 31 between the Basalt Pit and the Target No. 2 Pit, consisting of a truck shop, truck wash bay, fuel and oil storage and dispensing areas, a warehouse, and a septic system;
- Storm water diversion ditches;
- Water storage components including tanks, a pumping booster station, and a fresh water pond at the Section 30 Heap Leach Facility;
- Infill disturbance zones to accommodate miscellaneous land use and surface disturbance around the margins and in between the above described facilities; and
- Miscellaneous ancillary facilities including expanded fencing, a new lime silo southwest of the Section 30 Heap Leach Pad, and explosive storage facilities adjacent to the pits.

The Proposed Action would extend the mine operations an additional six years, through 2013.

1.4 Purpose of and Need for the Proposed Action

GMMC proposes to expand mining operations at the Glamis Marigold Mine for the purpose of extracting economically recoverable gold reserves in existing pits and to develop additional gold reserves known to exist south of the existing pit areas in an environmentally compatible manner. GMMC has identified the following economically driven project objectives:

- Expand processing facilities within the Project Area to accommodate an increase in the rate of production from 2.5 million tons per month or 30 million tons per year to 45 million tons per year and an increase in the rate of solution processing from the existing 3,000 gallons per minute (gpm) to 6,000 gpm at the Section 30 Heap Leach Facility;
- Extract economically recoverable gold that exists in the Project Area;
- Operate and reclaim the Project Area in an efficient, environmentally conscientious, and safe manner; and
- Meet or exceed federal, state, and local regulations for the protection of human health and safety, and the environment.

The project need is reflected by the demand for gold identified in national and global markets.

1.5 Relationship to BLM and Non-BLM Policies, Plans, and Programs

The BLM has the authority and responsibility to manage the surface and subsurface resources on public lands within its charge. The following provides a summary of the BLM and non-BLM policies, plans, and programs that direct mineral development and apply to the Proposed Action.

1.5.1 Surface Management Regulations

BLM's surface management regulations under the General Mining Law (43 CFR 3809) recognize the statutory right of mineral claim holders, such as GMMC, to explore for and develop federal mineral resources, and encourage such development. These same regulations require BLM to review proposed operations to ensure that:

- Adequate provisions are included to prevent unnecessary or undue degradation of public lands and to protect the non-mineral resources of the public lands;
- Measures are included to provide for reclamation of disturbed areas;
- Compliance with applicable state and federal laws is achieved; and

- Reclamation bonding is in place.

The 43 CFR 3809 were revised in 2001, and BLM has reviewed the PoO Modification to ensure it is in conformance with the revised surface management regulations, including the definition of unnecessary or undue degradation and the new performance standards.

1.5.2 Resource Management Plan

The BLM's Sonoma-Gerlach Management Framework Plan (MFP) contains no constraints that conflict with the Proposed Action. Management activities for the Proposed Action area are identified as livestock grazing, wildlife habitat, and recreation. Mineral resource development conforms to the Sonoma-Gerlach MFP, which states: "Make public lands and federally owned minerals available for the exploration and development of mineral and material commodities."

1.5.3 Mining and Mineral Policy Act

The Mining and Mineral Policy Act of 1970 (MMPA) mandates that federal agencies ensure environmentally responsible mine closure and reclamation by promoting the:

> "… development of methods for the disposal, control, and reclamation of mineral waste products, and the reclamation of mined lands, so as to lessen any adverse impact of mineral extraction and processing upon the physical environment that may result from mining or mineral activities."

The BLM policy and standards for reclamation are set forth in the *Solid Minerals Reclamation Handbook* (BLM Manual Handbook H-3042-1, BLM 1992a), the BLM Surface Management of Operations Handbook (Nevada State Office #H-3809-1), and through other BLM policy or guidance. The BLM has reviewed the PoO Modification for the proposed Millennium Expansion Project to ensure that the reclamation would meet the BLM reclamation standards and goals.

1.5.4 Cyanide Management Plan Requirements

The NSO of BLM has prepared and administers the *Nevada Cyanide Management Plan* (BLM 1992b) as required by BLM's national cyanide management policy. The *Nevada Cyanide Management Plan* would be applicable to the proposed heap leach facilities, and the precious metal recovery processes.

State standards, where established for mining operations, must also be considered. Nevada has established standards through the NDEP-BMRR. BLM would review the Millennium Expansion Project PoO Modification to ensure that it is in conformance with the *Nevada Cyanide Management Plan* and Nevada BLM's Guidance for Hardrock Mining Reclamation/Closure Activities – Management of Heap Leach Effluents (IM #NV-2000-066, August, 2000).

1.5.5 Local Land Use Planning and Policy

The Proposed Action is consistent with the Humboldt County zoning ordinances. The Project Area is zoned M-3 (Open Land Use District), and this land classification recognizes mineral extraction industries as an accepted land use. Article 10 of the Humboldt County Zoning Ordinance requires a Special Use Permit for mining operations located on private lands.

1.6 Environmental Review Process

Public involvement is an important and necessary component of the NEPA process. Documentation of this involvement has been compiled into a Project Scoping Document that includes a summary of the issues and concerns identified during the scoping process. The Project Scoping Document has been used by BLM to identify the key issues that would be analyzed in the SEIS and to identify concerns that are not considered critical in terms of anticipated effects

of the Proposed Action. The Project Scoping Document is on file and available for review during normal business hours at the BLM Winnemucca Field Office.

A Notice of Intent (NOI) to prepare the SEIS was published in the Federal Register on July 12, 2002. The NOI invited public scoping comments to be sent to the BLM through August 19, 2002. A letter announcing the proposed Millennium Expansion Project and public informational meeting dates and times was sent to all individuals, groups, and agencies that were on the Marigold Expansion EIS mailing list. The Millennium Expansion Project was also announced in the local newspapers and on the local radio station on various dates between July 19, 2002 and August 19, 2002. The newspaper articles briefly described the project, presented public informational meeting dates and times, and indicated that BLM was seeking public comments on the project. Public informational meetings were held in Winnemucca and Battle Mountain, Nevada. A total of ten members of the public attended the Winnemucca meeting on August 14 and five members of the public attended the Battle Mountain meeting on August 15. No comments were received at either of these meetings. Nine written comment letters were received by the BLM within the public comment period.

Consultation with Native American tribal organizations was initiated with a letter describing the proposed project and a request to be added to the agenda of the regularly scheduled monthly Native American-BLM coordination meeting. BLM and GMMC provided an overview of the project and fielded questions at meetings on August 21, 2002 and November 7, 2002. Native American tribal organizations were also invited to tour the existing and proposed mining areas in an effort to identify cultural and ethnographic issues. A tour was conducted on September 17, 2002, with three tribal representatives in attendance.

As a result of the public scoping process and initial Native American Consultation, the following potential project issues were identified by the public:

- Water Resources and Geochemistry
  Impacts to wetland and riparian areas
  Impacts to water quality and quantity (surface and groundwater)
  Red Rock Pit highwall stability
  Impacts to existing water rights
  Change in current permitted uses for GMMC
  Mobilization of arsenic
  Pit lake water quality
  Pit backfilling
  Heap leach closure

- Geology and Minerals
  Pit backfill

- Air Quality
  Impacts to air quality
  Fugitive dust – off site from mine vehicles

- Soils
  Impacts to soil quality

- Cultural
  Potential impacts to cultural sites

- Ethnography
  Access to historic hunting/food gathering areas

- Vegetation Resources
  Trace metal impacts to vegetation

- Wildlife and Fisheries Resources
  Impacts to terrestrial and aquatic wildlife and their habitats
  Impacts to migratory birds from land clearing activities and process solutions
  Dermal exposure to burrowing animals from contaminants in reclaimed facilities
  Noise impacts to wildlife
  Impacts to mule deer winter habitat
  Reclamation measures should include vegetation and habitat beneficial to wildlife
  Cumulative impacts to wildlife

- Special Status Species
  Impacts to sage grouse
  Impacts to invertebrates in springs
  Impacts to springsnails

Impacts to bats

- Range Resources
  Loss of forage during and after mining
  Impacts to sheep movements
  Loss of livestock water sources
  Availability of reclaimed vegetation
  Impacts to amount of land available for shearing areas

- Land Use and Access
  Access to private land and mineral claims
  Water rights impacts
  Impacts to grazing leases
  Impacts to roads from transportation of mine materials

- Hazardous Materials
  Transportation and storage of hazardous materials

- Cumulative Impacts
  Cumulative impacts from mining and other land uses in the area need to be analyzed

1.7 Authorizing Action

In addition to the SEIS, implementing the proposed project or alternatives would require authorizing actions from other federal, state, and local agencies with jurisdiction over certain aspects of the proposed project. Table 1-2 lists the required permits or approvals and the responsible regulatory agency.

1.8 Organization of the Supplemental Environmental Impact Statement

This SEIS follows the Council on Environmental Quality (CEQ) recommended organization (40 CFR 1508.9): Chapter 1.0 provides descriptions of the Proposed Action, relevant history of the project vicinity, purpose of and need for the Proposed Action, the environmental review process, applicable regulatory requirements and coordination, and organization of the SEIS; Chapter 2.0 describes the Proposed Action and alternatives in detail; Chapter 3.0 describes the affected environment, environmental consequences, mitigation and monitoring, and residual adverse impacts; Chapter 4.0 describes the cumulative impacts of the Proposed Action and other past, present, and reasonably foreseeable actions within the region. Chapter 5.0 summarizes public comments received during the scoping period. Chapter 6.0 summarizes consultation and coordination for preparation of the SEIS. Chapter 7.0 presents the list of preparers and reviewers and Chapter 8.0 is a glossary and list of acronyms. Chapter 9.0 is a list of references, and Chapter 10.0 is topical index. Copies of supporting documents are on file in the BLM's Winnemucca Field Office and the BLM NSO in Reno.

Table 1-2: Major Permits and Authorizations Required for the Proposed Millennium Expansion Project

Permit/Approval	Granting Agency
Federal Permits	
Plan of Operations Amendment N26-88-005P/NVN065034	U.S. Bureau of Land Management
Explosives Permit 9-NV-013-20-2A-12169	U.S. Bureau of Alcohol, Tobacco, and Firearms
Nevada State Permits	
Class II Air Quality Permit AP1041-0158	NV Division of Environmental Protection/ Bureau of Air Pollution Control
Reclamation Permit No. 0108	NV Division of Environmental Protection/ Bureau of Mining Regulation & Reclamation
Water Pollution Control Permit NEV88040	NV Division of Environmental Protection/ Bureau of Mining Regulation & Reclamation
Solid Waste Class III Landfill Waiver SWMI-08-41	NV Division of Environmental Protection/ Bureau of Solid Waste
General Storm water Discharge Permit NVR300000	NV Division of Environmental Protection/ Bureau of Water Pollution Control
Permit to Appropriate Waters	NV Division of Water Resources
Permit to Construct Impoundments	NV Division of Water Resources
Industrial Artificial Pond Permits	NV Division of Wildlife
Liquefied Petroleum Gas License - 3482	NV Board of the Regulation of LPG
Septic System Permit GNEV9201-4006	NV Division of Environmental Protection
County Permits	
Special Use Permit UH-88-08	Humboldt County Regional Planning Commission

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